



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/666,481	09/20/2000	Masayuki Morita	0250-0821	7125

22204 7590 05/21/2002

NIXON PEABODY, LLP  
8180 GREENSBORO DRIVE  
SUITE 800  
MCLEAN, VA 22102

EXAMINER

STOCKTON, LAURA LYNNE

ART UNIT	PAPER NUMBER
----------	--------------

1626

DATE MAILED: 05/21/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.



APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
--------------------	-------------	-----------------------	------------------

EXAMINER
----------

ART UNIT	PAPER NUMBER
----------	--------------

DATE MAILED:

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

### OFFICE ACTION SUMMARY

- ☒ Responsive to communication(s) filed on February 25, 2002
- ☒ This action is FINAL.

- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), ~~which~~ whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

#### Disposition of Claims

- ☒ Claim(s) 1-19 are pending in the application.  
Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-19 are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

#### Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. § 119

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

- ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

#### Attachment(s)

- ☐ Notice of Reference Cited, PTO-892
- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

-SEE OFFICE ACTION ON THE FOLLOWING PAGES-

09/606,481

## DETAILED ACTION

Claims 1-19 are pending in the application.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C.

112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

No support in the specification or originally filed claims can be found for the specific molar-equivalent ratios found in amended claim 1. Applicants did not indicate where support could be found for changing the molar-equivalent ratios. In original claim 1 and the instant specification on page 8, lines 21-24 and page 9, lines 1-9, it is described

that the molar-equivalent ratio of chlorinating agent to the compound of formula (I) is 2:1, not 3:1 as instantly claimed in amended claim 1.

Additionally, the described molar-equivalent ratio of chlorinating agent to the compound of formula (II) is 3:1, not 2:1 as instant claimed in amended claim 1.

The rejection of the claims under 35 U.S.C. § 102(b) over Kim et al. is being withdrawn at this time since claim 1, as amended with different molar-equivalent ratios than was originally filed, is not presently anticipated by Kim et al. {GB 2,308,364}. Similarly the rejection of the claims under 35 U.S.C. § 103 over Lewis et al. {U.S. Pat. 3,849,430} and Burri {Helvetica Chimica Acta, Vol. 72 (1989)} is also being withdrawn, for the same reason given above, at this time. Therefore, arguments pertaining to these references under these specific statutes will not be addressed. The rejection of the claims, in the previous Office Action under 35 U.S.C. 112, second paragraph, has been overcome.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-17 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Hahn et al. {U.S. 5,453,507}

Hahn et al. (Example 6 in column 5) disclose a process of making 2-methyl-4-isothiazoline-3-one wherein a N,N'-dimethyl-3,3'-mercaptopropionamide is reacted with sulfuryl chloride (e.g. a chlorinating agent) in methylene chloride (e.g. a solvent). The molar-equivalent ratio of the chlorinating agent to the N,N'-dimethyl-3,3'-mercaptopropionamide is 2:1 in Example 6. Therefore, Hahn et al. anticipate the instant claims.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. {GB 2,308,364} and Hahn et al. {U.S. Pat. 5,453,507}, each taken alone or in combination with each other.

*Determination of the scope and content of the prior art (MPEP §2141.01)*

Applicants claim a process of making a 2-alkyl-4-isothiazoline-3-one wherein an N-alkyl-3-mercaptopropionamide (or N,N'-di-alkyl-3,3'-dithiopropionamide) is reacted with a chlorinating agent (e.g. sulfuryl chloride – see instant specification on page 8, lines 16-19) in a solvent in which hydrogen chloride is insoluble or has low solubility {e.g. dichloromethane (same as methylene chloride) and dichloroethane – see instant specification on page 5, lines 10-17 and page 9, lines 16-27}.

Kim et al. (pages 7, 8, 14, 17 and 18) teach a process of making 2-methyl-4-isothiazoline-3-one wherein a N-methyl-3-mercaptopropionamide is reacted with sulfuryl chloride in 1,2-dichloroethane (Example 1 on page 17). Kim et al. also teach using N,N'-di-methyl-3,3'-dithiopropionamide instead of N-methyl-3-mercaptopropionamide as a reactant (page 8).

Hahn et al. (column 3, lines 33-52) teach a process of making a 2-alkyl-4-isothiazoline-3-one wherein a N,N'-di-alkyl-3,3'-mercaptopropionamide is reacted with sulfuryl chloride in an organic solvent (e.g. methylene chloride). Hahn et al. also teach the various molar ratios which are embraced by the instant claims.

*Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)*

The difference between some of the processes of the prior art and the processes instantly claimed is that of different molar ratios of the reactants.

*Finding of prima facie obviousness--rational and motivation (MPEP §2142-2413)*

The optimization of variables, such as pH and molar ratios, in a known process is *prima facie* obvious. The motivation to make the claimed compounds derives from the expectation that structurally similar compounds would possess similar activity (e.g. a biocide). Since each of Kim et al. and Hahn et al. teach a similar process, the combination of the two references would also teach the instant claimed invention. One skilled in the art would thus be motivated to utilize the processes of the prior art and modify the molar ratios of the reactants to arrive at the instant claimed process with the expectation of obtaining additional beneficial compounds that would be useful as, for example, biocides. Therefore, the instant claimed process would have been suggested to one skilled in the art.

*Response to Arguments*

Applicants' arguments filed February 25, 2002 have been fully considered. Applicants argue that the teaching in Kim et al. and the



instant claims is inconsistent. Applicants argue that Kim et al. teach a mixture of 2-methyl-4-isothiazoline-3-one and 5-chloro-2-methyl-4-isothiazoline-3-one unlike the present invention wherein 2-methyl-4-isothiazoline-3-one is produced in isolation.

Applicants' arguments have been considered but have not been found persuasive. Applicants claim a process of making a 2-alkyl-4-isothiazoline-3-one wherein an N-alkyl-3-mercaptopropionamide (or N,N'-di-alkyl-3,3'-dithiopropionamide) is reacted with a chlorinating agent, such as sulfuryl chloride, in a solvent in which hydrogen chloride is insoluble or has low solubility, such as methylene chloride. Kim et al. teach a similar process of making a 2-alkyl-4-isothiazoline-3-one wherein the same reactants are used as instantly claimed. Since Applicants have amended claim 1, claiming different molar ratios than originally filed, Kim et al. no longer anticipate claim 1. However, Kim et al. teach molar ratios ranges (page 14). Therefore, the rejection of the claims over Kim et al. under 35 U.S.C. § 103 is maintained.

Applicants argue that Hahn et al. do not teach or suggest the incorporation of the correlation between solubility of the hydrogen chloride in the solvent used in the reaction that led to the present invention. In response, Hahn et al. disclose every aspect of Applicants' claimed invention. See Example 6 in column 5 of Hahn.

Applicants argue that Hahn et al. have not isolated a 2-methyl-isothiazolin-3-one in pure form as have done the Applicants and that Hahn et al. have only isolated the salt of 2-methyl-isothiazolin-3-one, namely, 2-methyl-4-isothiazoline-3-one.HCl. In response, Applicants' claimed process does not claim 2-methyl-4-isothiazoline-3-one in its pure form. In the instant specification (page 10, lines 24-29), it is described that the hydrochloride salt of 2-alkyl-4-isothiazoline-3-one can be converted to 2-alkyl-4-isothiazoline-3-one by dispersion in water, neutralization with base, extraction with inert organic solvent and removal of the solvent. Independent claim 1 fails to claim such process steps. Also see Working Example 1 in the instant specification on page 11, lines 18-22.

Applicants argue that the nonobviousness of the present invention is further supported by a comparison of the results shown on page 14, Table 1 of the present application. In response, as stated in the previous Office Action, the showing in the specification on pages 12-14 has been considered. Firstly, the prior art used in the "comparative example" was not identified. Secondly, the closest prior art was not compared {e.g. comparative example on page 13 uses ethyl acetate as the solvent}. Also, see the above cited prior art and the solvents used therein. Thirdly, a direct comparison (having the same reaction conditions such as temperature and reaction time) of the process of Hahn et al. and the instant process (has not <sup>been</sup> done to over <sup>come</sup> the rejection under 35 U.S.C. § 103. As a result, Applicants cannot compare their results with those taught in Hahn et al. Therefore, the showing is not persuasive for overcoming the rejection of the instant claims under 35 U.S.C. § 103.

*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

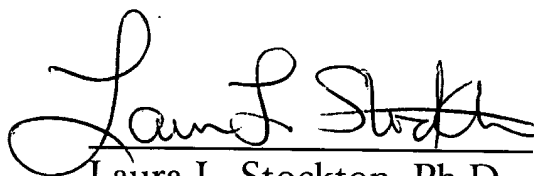
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to

Laura L. Stockton whose telephone number is (703) 308-1875. The examiner can normally be reached on Monday-Friday from 6:00 am to 2:30 pm. If the examiner is out of the Office, the examiner's supervisor, Joseph McKane, can be reached on (703) 308-4537.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-1235, 308-0196 or 305-3290.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4556, 308-4242, 305-1935 or 308-2742.

A handwritten signature in black ink, appearing to read "Laura L. Stockton", written over a horizontal line.

Laura L. Stockton, Ph.D.

Patent Examiner

Art Unit 1626, Group 1620

Technology Center 1600

May 17, 2002